disclaim (having no title to it) the experience he assigns to me in reference to the dangerously ulcerated throat, never having made myself a martyr to science by so experimenting in *propria persona*. I have no doubt, however, as I have elsewhere stated, that this method of treating a cobra bite would not be devoid of danger to the operator.

As to venomous caterpillars. There is one much dreaded by sportsmen in the Himalayan Terai. It is said to be apt to fall from the trees on to persons passing or resting beneath their branches, and causes great irritation of the parts with which it comes in contact, amounting, I have been told, in some cases to erysipelatous inflammation. It is a moderate-sized, dark-coloured, hairy caterpillar, and known (I believe) in those parts of the Terai where I have been, as the *komla*. I have never seen it, but during my tiger-shooting expeditions into the Terai, it was always one of the probable inconveniences to be looked for in a camp in the tree jungle. I have heard many stories of the painful and irritating effects of contact with this creature, whose hairs are said to cause those results not only by breaking into but by also inoculating some irritating secretion into the skin.

London, May 4 J. FAYRER

I HAVE just read with interest your report of the paper on "Venomous Caterpillars," which appeared in your last. Towards the end of the report Mr. A. Murray refers to a hairy caterpillar which he received from Brazil, and remarks that "if the caterpillars have a special venom, then, as in the nettle, there should be a gland at the base of each hair, which should be hollow." I think I know the caterpillar to which he refers, and if I am right, its hairs are not exactly venomous, but produce a considerable amount of irritation in the skin. When in Brazil in 1859, I collected some of these caterpillars. They are very similar in appearance to the larvæ of the British Arctia, but when their hairs are examined under a microscope, they are found to consist of a series of barbed points, the point of each succeeding barb fitting into the divergence of the preceding barbs; at least, that is my recollection, for I have not examined them since then, and cannot find any specimens to do so now. The caterpillar is called in Maranham, "largata de fogo," that is, "fire caterpillar." After these hairs have afforded their protection to the caterpillar during its life, it carefully removes them from its body and weaves them in its cocoon, so that the pupa is thus as safe from intruders as the larva itself was. When a child, I recollect that Maranham was occasionally visited by great numbers of a particular kind of moth, the dust of whose wings produced a very great irritation on the skin, the least touch of one being sufficient to render you miserable for the rest of the evening. I perfectly remember a drove of these putting a quick temination to a small dance at home, as you may easily conjecture that ladies in evening costume are not well protected against such visitors. When in Maranham in 1859, I heard that these moths had not been seen there for many years. I believe their visits were during the rainy season. Some of the British Bombices, *B. quercus*, for example, and some of other genera, are said to possess irritable hair. But in *B. quercus* the hairs are not barbed, and, not being an entomologist, I can give no information respecting the others. HENRY S. WILSON

Anatomical School, Cambridge, May 5

On some Errors of Statement concerning Organ-pipes in Recent Treatises on Natural Philosophy

THAT our best teachers of science, both in their books and lectures make statements which are erroneous in fact, and inferences which are misleading whenever they touch upon the subject of wind instruments is not a little surprising, considering that intellects so highly trained hold in aversion any approach to inexactness, and the strangeness of it is that the errors arise through an ancient human custom, now supposed obsolete among philosophers, of "speaking without knowledge."

The evidence, if tendered, would fill some few pages of this paper, and if names were appended to the quotations the list would include authors most esteemed and honoured.

To cite two instances among many—and they are from works of unquestioned value and authority, and supposed to bring down sciences to the latest date—in the recently completed translation by Prof. Everett of Prof. Privat-Deschanel's "Natural Philosophy," the following passage occurs in explanation of the organ-pipe:—"The air from the bellows arrives through the conical tube at the lower end, and before entering the main body of the pipe has to pass through a narrow slit, in issuing from which it impinges on the thin end of the wedge placed directly opposite, called the lip. This lip is itself capable of vibrating in unison with any note lying within a wide range, and the note which is actually emitted is determined by the resonance of the column of air in the pipe." In another equally valuable work, the "Physics," by Prof. Ganot, translated by Prof. Atkinson, this description is given respecting the free-reed—"the tongue which vibrates alternately before and behind the aperture, merely grazing the edges as seen in the harmonium, concertina, &c., such a reed is called a free reed." Four professors responsible for statements so perversely at variance with facts that it is not possible either writer can have even attempted to ascertain, still less to demonstrate that the facts are as asserted. Practical experience affirms that the lip of the organ-pipe does not vibrate; press it with your hand or hold it in a vice to deaden the assumed vibration, and you will not alter one iota of the pitch of the sounding note: that the free-reed does not in its vibration "merely graze the frame;" it would be fatal to its proper speech if it did, and its vibrations would be checked in a jarring rattle. The facts are too simple to need argument; all that was required was observation.

When Ganot, describing a metal free reed, affirms as a law that when the force of air is increased the pitch of the reed rises, his statement is inexact, for it depends entirely on the accident of taking up a reed more or less rigid in proportion to scale, whether the experimentalist shall prove his assertion or prove the reverse. In the harmonium, of a set of five octaves of reeds, half will go more or less sharp, and half will go more or less flat, as the force of wind is increased, a fact which, if more generally known, might induce players to mitigate some of the insufferable harshness and jangling inflicted on listeners. That "a sharp edge" is essential to the functions of the flue organ-pipe is one of the commonest errors entertained by philosophers, and it forms the groundwork for whole pages of false theory. In treatise after treatise it is stated "the air is driven against the sharp edge," "is split upon the sharp edge, and by concussion caused to proceed intermittingly," "the air strikes the sharp edge," "is divided," "is lacerated," "strikes against the upper lip, and a shock is produced which causes the air to issue in an intermittent manner." Another equally common misstatement, and important because so strongly influencing theory, is that "a closed pipe gives a note an octave in pitch lower than an open pipe of the same length; the length of a closed organ-pipe is one-fourth that of the sonorous wave it produces in the air." Proved facts give different results. At my hand this morning there stood a sounding-pipe perfect in finish, its lip quite blunt, by measurement at the edge half an inch in thickness; and whole ranks of pipes were there in various grades of conformation, showing that the sharp edge was immaterial to the functions of a speaking-pipe. Sometimes the chamfering of the lip is desirable, sometimes not, and the builder decides according to the quality and character of each stop. The art in "voicing" a pipe consists in so directing the stream of air that it shall avoid striking the lip, and shall smoothly glide past without shock or noise, or concussion; you get no tone until it does. Actual experiment will show that a closed pipe gives a note only a major seventh below the note it gives as an open pipe, not an octave below; indeed, in the higher range of pipes it will be a whole tone short of the octave, to sound which the pipe would need to be made considerably longer. As having some significance in connection with this, it may be mentioned that there is in an open pipe, whilst sounding, a centre of equilibrium of pressure; it does not occur, as supposed, at the true half of the length, but somewhat below that division; as evidence, take the Flute Harmonique, when desiring to strike the node, it will always be found below the half. Further, as to length. If the open diapason pipe beside me, giving as fine a tone (CCC) as musician can desire, measures 14 ft. 10 in. in length, and its corresponding sound-wave claims 16 ft. or nearer 17 ft., the wide divergence merits better investigation than it has hitherto received. The experiments of Regnault and Seebeck are highly important to this question, but do not reach the conditions pressing for explanation in a speaking organ-pipe. To attempt to demonstrate the laws of organ-pipes with a tuning-fork is as inconclusive as sending galvanic electricity through a dead body and calling the movement life.

There is little difficulty in understanding how it happens that errors respecting wind instruments arise and are perpetuated. Experimental philosophers are occupied with the weightier matters of science, are rarely musicians or familiar with wind instru-

© 1873 Nature Publishing Group

ments; of the trouble and anxiety their caprices give at home and in the workshop they have no knowledge. The organ-pipe is brought into the lecture-room, it is caused to prove what is wanted, more is not looked for; it comes like a beauty in a ballroom, dressed up to play a part and be amiable and gracious: the practical man knows that organ-pipes are very like human beings, of whom Goethe says, "We do not learn to know people when they come to us; to learn their real peculiarities we must go to them."

April 18 Hermann Smith

Rock Inscriptions of Brazil

Being unable to attend the reading of Mr. Whitfield's paper, at the Anthropological Institute, April 22, the following observations are offered.

The rock inscriptions of Brazil are worthy of attention, because they appear to belong to a vast series, to which Mentone affords a large contribution. The suggestion that in the very earliest epochs tally records existed, lends interest to the investigation. It appears probable that military tallies of the levy of men preceded the registers in the historical period of the tribute of men, arms, and money by provinces, such as we find in Herodotus with regard to Persia.

In reference to the possible general connection of such inscriptions as these with the eastern world, it may be observed that Brazil has participated in at least two great migrations.

The Kiriri and Sabuyah of Bahia are allied by language to the ancient Pygmean or Negrito stock. This race is everywhere very low, and cannot have produced even these inscriptions.

The greater part of Brazil is covered by the Guarani or Tupi (Agua) languages allied to the Agau of the Nile region, the Avkhass of Caucasia, &c. It is worth inquiry whether the Mentone inscriptions may not belong to this epoch.

Hyde Clarke

Abnormal Coloration in Fish

Seeing Mr. W. S. Kent's letter on this subject in Nature of the 8th inst., a similar instance was recalled to my memory. About three weeks ago I observed in a fishmonger's shop a plaice, nearly one third of the under side of whose body (at the tail) had the usual colour and orange spots of the upper. In this specimen the spots were more numerous and brilliant than usual. The line of demarcation was irregular, but abrupt. The circumstance struck me because I have seen great numbers of Pleuronectidæ, but never one marked thus. The fishmonger told me that he had never seen a like specimen.

Arthur Nicols

Phosphorescence in Wood

From the description given by your correspondent, Richard M. Barrington (vol. vii. p. 464) of phosphorescence in coniferous wood, I should imagine it to be extremely probable that the pieces of Scotch fir in question were infested with the spawn of *Polyporus annosus* Fr., a fungus very common on the Coniferæ. The mycelium of this plant (as well as the perfect fungus) is well known to be at times highly phosphorescent, and in the *Gardener's Chronicle* for September 28, 1872, I have figured the perfect state of it as seen so commonly in a luminous condition in the coal mines of Glamorganshire. In these deep pits the spawn of this fungus ramifies about the old shoreing timber, and is so highly phosphorescent as to be clearly seen from a distance of twenty yards. Many other fungi with their mycelia are known to be at times phosphorescent, as *Polyporus sulfureus* Fr. and *Corticium cæruleum* Fr., both common on decaying wood.

In the *Gardener's Chronicle* for September 21, 1872, the Rev. M. J. Berkeley has published a remarkable case of phosphorescence in logs of larch. Here the most luminous parts were where the mycelium was most developed, and the wood gave out such a blaze of white light that although the pieces were wrapped in five folds of paper, yet the light shone through as if the specimens were exposed. The phosphorescence appears to accompany the decomposition of the wood on which the fungi at the same time prey.

W. G. Smith

Coincidence of the Spectrum Lines of Iron, Calcium, and Titanium

In Prof. Young's letter published in Nature, vol. vii., p. 17, some coincidences of the lines of different substances which "are too many and too close to be all the result of accident" are referred to, those of iron with calcium and titanium being especially cited. Two explanations are offered, first that "the metals operated upon by the observers who first mapped out the spectra were not absolutely pure," and second, that "there is some such similarity between the molecules of the different metals as renders them susceptible of certain synchronous periods of vibration."

If we are driven to this second explanation the received inductions of spectrum analysis and the deductions of celestial chemistry based upon them are shaken at their foundation, for if more than one known terrestrial element can display identical lines in the spectrum, the suggestion that other unknown celestial elements may do the same is freely opened. It is therefore very desirable that the spectroscopist should receive all the aid which the studies of chemical specialists can afford him towards the solution of this problem.

I may venture to speak to the instances quoted by Prof. Young. First as regards calcium and iron. In making analyses of a large number of brands of pig iron I found that they all contained calcium, but in very variable proportions, and endeavoured by observing their properties, and by further examination of finished iron, to learn how the presence of calcium affected the quality of iron, but failed to solve this problem. In the course of these investigations, I found that the finished iron, like the pig, presented considerable variations as regards the quantity of calcium contained in it, *but I never found a sample of iron or steel quite free from some trace of calcium.* As I was operating for the most part on superior qualities of iron which had been submitted to the utmost practicable degree of commercial purification, this experience renders it extremely probable that Prof. Young's first explanation is the correct one, so far as iron and calcium are concerned.

The want of any chemical reagent by which minute traces of titanium can be detected in the presence of large quantities of iron, or of a means of completely separating these metals, places a serious difficulty in the way of directly answering the question whether iron is usually associated with traces of titanium; but there are indirect evidences of its very common existence in ordinary iron. The most decided of these is afforded by the common, almost universal, occurrence of the beautiful copper-coloured crystals of cyano-nitride of titanium in the hearth bottoms of blast-furnaces. In many cases their concretions form large masses, where the ores that have been used are not supposed to be titaniferous.

Metallic iron obtains impurities, not only from its ore, but also from the fuel and flux used in reduction, and besides these from the furnace or crucible in which it has subsequently been fused or raised to its welding point. The difficulty of completely purifying iron is so great that many such coincidences as those referred to may be expected *a priori.*

W. Mattieu Williams

Musical Stones

When roaming over the hills and rocks in the neighbourhood of Kendal, which are composed chiefly of mountain limestone, I have often found what we call here "musical stones." They are generally thin flat weather-beaten stones, of different sizes and peculiar shapes, which when struck with a piece of iron or another stone, produce a distinct musical tone, instead of the dull heavy leaden sound of any ordinary stone. The sound of these stones is, in general, very much alike, but I know gentlemen who possess sets of eight stones which are said to produce, when struck, a distinct octave. Being only an amateur geologist, I am unable to account for this fact, and would be glad if any of your numerous readers would take the trouble to explain to me, through the medium of your columns, the peculiar composition of the stone in question, and the distinct qualifications nencessary to form a musical stone.

Richard J. Nelson

Acquired Habits in Plants

In Nature of May 1, p. 7, which I chance not to have seen till now, Mr. Babbington puts a question on the subject of my climbing specimen of violet which I fear I am not botanist enough to answer.

© 1873 Nature Publishing Group